IN THE CLAIMS:

1.-9. (Canceled)

10. (Original) A method of forming a dielectric barrier layer, the method comprising:

forming a first silicon nitride layer on an exposed copper surface; and

forming a second silicon nitride layer on said first silicon nitride layer while adjusting a silicon concentration of said second silicon nitride layer to be higher than that of said first silicon nitride layer.

11. (Original) The method of claim 10, wherein said first and second silicon nitride layers are formed without interrupting a vacuum.

12. (Original) The method of claim 10, wherein said second silicon nitride layer is formed while changing a first set of deposition parameters to a second set of deposition parameters.

13. (Original) The method of claim 10, wherein said first silicon nitride layer is formed with a first set of a deposition parameters and said second silicon nitride layer is formed with a second set of deposition parameters, and deposition of said first silicon nitride layer is stopped prior to establishing said second set of parameters.

14. (Original) The method of claim 12, wherein said first set of deposition parameters includes at least one of a silane flow rate and an ammonia flow rate.

15. (Original) The method of claim 13, wherein said first set of deposition parameters includes at least one of a silane flow rate and an ammonia flow rate.

16. (Previously Presented) The method of claim 13, wherein said first and second silicon nitride layers are deposited in a plasma ambient.

17. (Original) The method of claim 16, wherein said plasma ambient is controlled so as to stop the formation of said first silicon nitride layer prior to forming said second silicon nitride layer.

18. (Original) The method of claim 10, wherein a thickness of said first silicon nitride layer is in the range of approximately 2-10 nm.

19. (Original) The method of claim 10, wherein a thickness of said first silicon nitride layer is in the range of approximately 20-70 nanometer.

20. (Original) The method of claim 10, further comprising treating said exposed copper surface by exposing the copper surface to a plasma ambient prior to forming said first silicon nitride layer.

21. (Original) The method of claim 20, wherein treating said copper surface and forming said first silicon nitride layer is performed without interrupting a vacuum established over said copper surface.

22. (Original) The method of claim 21, wherein said second silicon nitride layer is formed without interrupting said vacuum.

23. (Previously Presented) A method of forming a dielectric barrier layer, the method comprising:

forming a first silicon nitride layer on an exposed copper surface; and

forming a second silicon nitride layer on said first silicon nitride layer while adjusting a silicon concentration of said second silicon nitride layer to be higher than that of said first silicon nitride layer, wherein said first and second silicon nitride layers are deposited in a plasma ambient that is controlled so as to stop the formation of said first silicon nitride layer prior to forming said second silicon nitride layer.

24. (Previously Presented) The method of claim 23, wherein said first and second silicon nitride layers are formed without interrupting a vacuum.

25. (Previously Presented) The method of claim 23, further comprising treating said exposed copper surface by exposing the copper surface to a plasma ambient prior to forming said first silicon nitride layer.

26. (Previously Presented) The method of claim 25, wherein treating said copper surface and forming said first silicon nitride layer is performed without interrupting a vacuum established over said copper surface.

27. (Previously Presented) A method of forming a dielectric barrier layer, the method comprising:

treating an exposed copper surface by exposing the copper surface to a plasma ambient;

after exposing said copper surface to said plasma ambient, forming a first silicon nitride layer on said copper surface; and

forming a second silicon nitride layer on said first silicon nitride layer while adjusting a silicon concentration of said second silicon nitride layer to be higher than that of said first silicon nitride layer, wherein treating said copper surface and forming said first and second silicon nitride layers is performed in a vacuum without interrupting said vacuum.

28. (Previously Presented) The method of claim 27, wherein said second silicon nitride layer is formed while changing a first set of deposition parameters to a second set of deposition parameters.

29. (Previously Presented) The method of claim 27, wherein said first silicon nitride layer is formed with a first set of a deposition parameters and said second silicon nitride layer is formed with a second set of deposition parameters, and deposition of said first silicon nitride layer is stopped prior to establishing said second set of parameters.

30. (Previously Presented) The method of claim 27, wherein said first and second silicon nitride layers are deposited in said plasma ambient.

31. (Previously Presented) The method of claim 30, wherein said plasma ambient is controlled so as to stop the formation of said first silicon nitride layer prior to forming said second silicon nitride layer.

32. (New) The method of claim 10 , wherein forming said first silicon nitride layer comprises performing a deposition process comprising a silane flow rate of approximately 120-170 sccm and a nitrogen flow rate of approximately 220-330 sccm, and wherein forming said second silicon nitride layer comprises performing a deposition process comprising a silane flow rate of approximately 200-250 sccm and a nitrogen flow rate of approximately 30-80 sccm.

33. (New) The method of claim 23, wherein forming said first silicon nitride layer comprises performing a deposition process comprising a silane flow rate of approximately 120-170 sccm and a nitrogen flow rate of approximately 220-330 sccm, and wherein forming said second silicon nitride layer comprises performing a deposition process comprising a silane flow rate of approximately 200-250 sccm and a nitrogen flow rate of approximately 30-80 sccm.

34. (New) The method of claim 27, wherein forming said first silicon nitride layer comprises performing a deposition process comprising a silane flow rate of approximately 120-170 sccm and a nitrogen flow rate of approximately 220-330 sccm, and wherein forming said

second silicon nitride layer comprises performing a deposition process comprising a silane flow rate of approximately 200-250 sccm and a nitrogen flow rate of approximately 30-80 sccm.

35. (New) A method of forming a dielectric barrier layer, the method comprising:

forming a first silicon nitride layer on an exposed copper surface by performing a deposition process comprising a silane flow rate of approximately 120-170 sccm and a nitrogen flow rate of approximately 220-330 sccm; and

forming a second silicon nitride layer on said first silicon nitride layer by performing a deposition process comprising a silane flow rate of approximately 200-250 sccm and a nitrogen flow rate of approximately 30-80 sccm, wherein a silicon concentration of said second silicon nitride layer is higher than that of said first silicon nitride layer, and wherein said first and second silicon nitride layers are formed without interrupting a vacuum.

36. (New) The method of claim 35, wherein said plasma ambient is controlled so as to stop the formation of said first silicon nitride layer prior to forming said second silicon nitride layer.

37. (New) The method of claim 35, further comprising treating said exposed copper surface by exposing the copper surface to a plasma ambient prior to forming said first silicon nitride layer.

38. (New) The method of claim 37, wherein treating said copper surface and forming said first silicon nitride layer is performed without interrupting a vacuum established over said copper surface.